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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,961	07/30/2001	Heather Noel Bean	10011698	9356

7590

06/16/2004

HEWLETT-PACKARD COMPANY  
Intellectual Property Administration  
P.O. Box 272400  
Fort Collins, CO 80527-2400

EXAMINER
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ROSARIO-VASQUEZ, DENNIS

ART UNIT	PAPER NUMBER
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2621

DATE MAILED: 06/16/2004

3

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/917,961

Applicant(s)

BEAN ET AL.

Examiner

Dennis Rosario-Vasquez

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Double Patenting*

1. Claims 1 and 16 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 09/905,494. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1 and 16 of the instant application are broader than the claim 1 of copending Application No. 09/905,494.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1,2,5,8,10,13,16,17 are rejected under 35 U.S.C. 102(b) as being anticipated by Barrett et al. (US Patent 6,005,990 A).

Regarding claim 1, Barret et al. discloses an imaging module (Fig. 1, num.110 is an optical shutter and 106 is an optical sensor.) for still digital image capturing device, comprising:

a) an electronic imaging sensor device (fig. 1, num. 106 or depicted as fig. 5, num. 106) comprising a plurality of pixel elements (Fig. 5, num. 500 is an independent photosensor among a plurality or multiple of photosensors at col. 5, lines 2-4). ;

b) an electronically actuatable shutter device (Fig. 1, num. 110 is an optical shutter.) comprising a plurality of individually addressable (Barret et al. states, "Each shuttering element may be activated and de-activated in response to signals [or addresses that activate or de-activate each shuttering element] from the scanner controller 108 (col. 3, lines 42-44)." Note that the scanner controller uses a RAM or ROM memory for computer-executable instructions at col. 5, lines 30-35. Thus, the use of the signals from the scanner controller that uses RAM or ROM as storage activates or de-activates the individual shuttering elements.) and actuatable shutter elements (Barret et al. states, "The optical shutter 104 comprises an assembly of individually controlled, electronically activated shuttering elements (col. 3, lines 40-42)."), each of said plurality of individually addressable shutter elements substantially corresponding to at least one of said plurality of pixel elements (Barret et al. states, "Each sensor may correspond to one shuttering element of the optical shutter 104, multiple shuttering elements, or even a sub-portion of one shuttering element, depending upon the needs of the application (col. 5, lines 5-9).") Note that the shuttering elements correspond to pixels if an LCD screen is used as the optical shutter at col. 3, lines 54-56. Thus the corresponding sensor elements correspond to the shutter elements that correspond to pixels of the LCD.

Regarding claim 2, Barret et al. discloses the apparatus of claim 1, wherein said imaging sensor device comprises a two-dimensional array of pixel elements (Figure 5, num. 106 is a two-dimensional array of the photosensors) and said shutter device comprises a LCD element comprising a two-dimensional array of individually addressable and actuatable shutter elements corresponding to said two-dimensional array of pixel elements (This portion of was addressed in claim 1).

Claim 5 has been addressed in claim 1.

Regarding claim 8, Barret et al. discloses the apparatus of claim 1, wherein said shutter device "LCD screen" is formed on (A laptop computer's LCD screen is placed against the optical sensor.) and is substantially co-planar (or "against") with said imaging sensor device (or "optical sensor 106"). Barret et al. states, "If the backlight of the laptop computer is used as the light source 102, the optical sensor 106 is placed against the computer's LCD screen (col. 8, lines 47-49)." Note that "In the laptop computer environment, the optical shutter 104 preferably comprises an LCD screen...(col. 3, lines 54,55)."

Claim 10 has been addressed in claims 1,2 and 8.

Claim 13 has been addressed in claim 5.

Claim 16 has been addressed in claim 1.

Claim 17 has been addressed in claim 8.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3,4,6,7,9,11,12,14,15,18,19,20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barrett et al. (US Patent 6,005,990 A) in view of Brennessoltz (US Patent 6,280,034 B1).

Regarding claim 3, Barret et al. teaches the apparatus of claim 1, wherein said shutter device comprises a LCD element comprising a two-dimensional array of individually addressable and actuatable shutter elements and wherein a pixel unit of said imaging module comprises:

a) a first combination (Figure 1, numerals 110 or optical shutter (LCD shutters have a pixel array.) and 106 or optical sensor are combined together to form a pixel element that "correspond[s]" to a photosensor fig.5, num. 500 of the optical sensor (fig. 5, num. 106) and the shuttering element ("correspond[s]" at Barrett et al., col. 5, lines 5-9).) polarizing (Polarization is in either "opaque" or "transparent" states for transmission of light through the shutter that are in opposite or polarized states at col. 1, lines 34-37.) shutter element (Figure 1, num. 104 or optical shutter) and pixel element (The pixel element is formed on the LCD at col. 3, lines 54-56.), with said first polarizing shutter element being of a first polarization (or the "opaque" state); and

b) a second (Barret et al. states, "The optical shutter 104 comprises an assembly of...shuttering elements (col. 3, lines 40-42)." Note that an assembly of...shuttering elements has a multitude of shutters.) combination polarizing shutter element and pixel element (Addressed above.), with said second polarizing shutter element being of a second polarization (or the "transparent" state as described above.);

c) wherein said pixel unit is individually addressable and actuatable (Addressed in claim 1).

Barret et al. does not teach an orientation for both shutters. However, Barret et al. does state that LCD screens are well known in the art at col. 3, lines 65-67, and "the assembly of shuttering elements comprises an array of LCD pixels (col. 3, lines 55,56).".

However, Brennesholtz, in the field of endeavor of image projection, does teach

a) a first combination polarizing shutter element (fig. 7, num. 82:"PATTERN POLARIZING COLOR SHUTTER (NON-ABSORBING)") and pixel element (fig. 7, num. 86: "LCD #1" includes a pixel array.), with said first polarizing shutter element being of a first polarization orientation (Using figure 7, Brennesholtz states, "If the [selective polarization filter or] SPF, [fig. 7, num. 82] is driven so that the polarization of one light band, e.g., green, is rotated [or oriented] 90 degrees, green light will transmit through the first [fig. 7, num. 84] and second [fig. 7, num. 85] PBS (without reflection therein), illuminating the first LCD [fig. 7, num. 86] for spatial light modulation thereof in a desired pixel pattern (col. 7, lines 38-42)." Thus figure 7. numerals 84 and 85 allow the 90 degree oriented light band to pass through to LCD 86) ; and

b) a second combination polarizing shutter element (fig. 7, num. 82: "PATTERN POLARIZING COLOR SHUTTER (NON-ABSORBING)") and pixel element (fig. 7, num. 89: "LCD #2"), with said second polarizing shutter element being of a second polarization orientation (Remaining light band, magenta, are directed to LCD #2[ of fig. 7] via numerals 84 and 87. Note that the magenta light band is not shifted 90 degrees during the SPF operation (col. 7, lines 42-45.) that is substantially orthogonal (Since the magenta light band was not shifted 90 degrees, the green light band is shifted 90 degrees or orthogonally with respect to the magenta light band. Note that 90 degrees corresponds to right angles, which are orthogonal or perpendicular to each other.) to said first polarization orientation;

Claim 4 is similar to claim 2 except for requiring a microelectromechanical shutter element. Barret et al. does not teach a microelectromechanical shutter element, but does suggest that LCD screens are well known in the art at col. 3, lines 65-67, and "the assembly of shuttering elements comprises an array of LCD pixels (col. 3, lines 55,56)."

Brennesholtz does teach a microelectromechanical shutter (Fig. 9) that performs the same operation of figure 7, num. 82.

Regarding claim 6, Barret et al. teaches the apparatus of claim 1, further comprising a memory (fig. 1, num. 111: "STORAGE UNIT") and does suggest a predetermined scanning pattern in the abstract, but does not teach pattern storage as required in claim 6.



However, Brennesholtz teaches claim 6 of the apparatus of claim 1, further comprising a memory including a pattern storage capable of storing one or more shuttering patterns that specify a plurality of shutter addresses of shutter elements to be actuated (using figures 6 and 7, Brennesholtz states, "In figure 6, the shutter[or figure 7, num, 82:"PATTERNED POLARIZING COLOR SHUTTER(NON-ABSORBING)] is shown divided into 20 separate horizontal segments [as a pattern] 70, each independently addressable and selectable for a desired state (col. 7, lines 9-11)." Note that "desired state" refers to a desired polarization as an orientation or horizontal/vertical state of light; therefore each horizontal segment can be in either state that forms various stripes as a pattern of orientations. Even though a memory is not depicted, the shutters are addressable, which implies that a memory is used.

Regarding claim 7, Brennesholtz teaches the apparatus of claim 1, further comprising a memory including a pattern storage capable of storing one or more shuttering patterns (This portion was addressed in claim 6.) that specify a plurality of exposure time periods (Brennesholtz states, "In the typical LCD [or figure 7, num. 86,89, LCD #1,2,respectively.]...the data is loaded one row at a time [as a time period]...(col. 11, lines 12,13).") corresponding to a plurality of shutter elements to be actuated (Brennesholtz states,"...and the state[or polarity orientation] of the LCD changes immediately after the data is loaded (col. 11, lines 13,14)." Note that the "state of the LCD" corresponds to the [electronic-selective polarization filter or] E-SPF of figure 7, num. 82. Note that "The [E-SPF] device responds to analog control and therefore

intermediate states between horizontal and vertical can be achieved (col. 5, lines 44-46).” And an E-SPF is an SPF with a LCD at col. 5, lines 13-16.).

Claim 18 was addressed in claims 2 and 3 except for wherein the method provides a substantially non-polarized light to said imaging sensor device. Brennesholtz additionally teaches the method of claim 16 wherein the method provides a substantially non-polarized light (Figure 7 has a small two-headed arrow or non-polarized or “unpolarized” light that points to an LCD, numeral 86) to said imaging sensor device (fig 7, num. 86). Note that figure 7, num. 81 is unpolarized white light (abstract). Brennesholtz states,” When the E-SPF 82 is deactivated and does not change the polarization of any color light, substantially all light will pass through the first PBS 84 and the second PBS 85, and illuminate the first LCD 86 (col. 9, lines 16-20).”

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the opaque and transparent polarity of the shutters and corresponding sensors of Barret et al. with the orientation teaching of Brennesholtz, because Brennesholtz’s orientation and polarity teaching that polarizes light in to RGB-CMY colors provides the use of 100% of the polarized light (col. 8, lines 1,2), has less severe color saturation issues than RGBW systems (col.8, lines 2,3), and luminance augmentation is higher than RGBW systems (col. 8, line 6-9).

Regarding claim 9, Barret et al. teaches the apparatus of claim 1, wherein said shutter device is substantially co-planar with said imaging sensor device as addressed in claim 8. Barret et al. does not teach an assembly of the shutter device, but does suggest "The construction and operation of b/w and color video screens, such as LCD screens, is well known (col. 3, lines 65-67)." Note that "In the laptop computer environment, the optical shutter 104 preferably comprises an LCD screen...(col. 3, lines 54,55)."

However, Brennesholtz teaches the apparatus of claim 1, wherein said shutter device (fig. 2, numerals 1,1', 1" and 3,3', 3" and glass) are shutters or retarders as depicted in figure 7, num. 82) is assembled (The shutter device is stacked in multiple layers as depicted in figure 2.) with and substantially co-planar (Each layer is touching as depicted in figure 2.) with said imaging sensor device (Figure 2, numerals 2,2',2" are LCD's that are assembled with adjacent shutters 1,1',1" and 3,3',3" and respective glass layers.)

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the teaching of Barret et al.'s LCD screen as a shutter with the way the shutter is assembled of Brennesholtz, because Brennesholtz's assembly of a shutter "has the advantages...of no moving parts, making a system more compact and more rugged...(col. 6, lines 55-57)." Therefore the laptop computer environment of Barret et al.'s can have durable and compact laptop computers with Brennesholtz's assembly of a shutter that can be used with the laptop's LCD screen.

Claim 11 has been addressed in claim 3.

Claim 12 has been addressed in claim 4.

Claim 14 has been addressed in claim 6.

Claims 15,20 have been addressed in claim 7.

Claim 19 has been addressed in claim 6.

***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Okamura et al. (US Patent 5,572,343) is pertinent as teaching a method of rotating light 90 degrees (figure 26, labels "P1" and "P2") using a liquid crystal shutter (figure 26, label: "LC").

Russell (US Patent 5,379,266 A) is pertinent as teaching a method of addressing light values (fig. 14a, num. 37) as depicted in figure 14.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario-Vasquez whose telephone number is 703-305-5431. The examiner can normally be reached on 9-5.

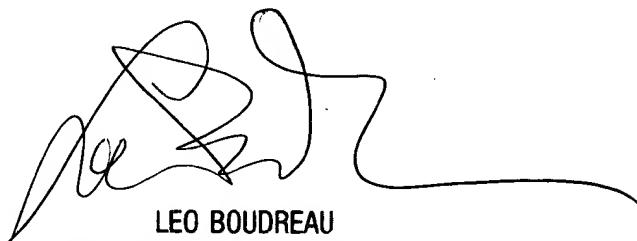
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2621

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DRV

Dennis Rosario-Vasquez  
Unit 2621

A handwritten signature in black ink, appearing to read 'Leo Boudreau', with a long horizontal flourish extending to the right.

LEO BOUDREAU  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600